

## **408g Tetrafluoromethane Adsorbed on Hipco Nanotubes**

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We present the results of an adsorption isotherm study of CF<sub>4</sub> on bundles of purified HiPco nanotubes produced by CNI. Prior to the performance of the adsorption measurements the nanotubes were placed in a stainless steel cell and heated under vacuum to 400 C for three hours. The cell was then sealed and transferred to the adsorption setup, with the contents under vacuum. Using 19.1 Å<sup>2</sup>/molecule for the area of CF<sub>4</sub>, we found the specific surface area of our sample to be 606 m<sup>2</sup>/gram. This value is very close to the one we obtained for another sample from the same batch of nanotubes, which were not subjected to vacuum heat treatment (we found a surface area of 610 m<sup>2</sup>/gram in Xe measurements for them). Seven full monolayer isotherms were measured between 99.1 and 138.7 K. Four isotherms were measured for coverages in the lower 1/3 of the first layer only, at temperatures between 173.7 and 203.7 K. The lower-temperature isotherms were used to identify the presence of different groups of adsorption sites on the bundles. We found two substeps in the first layer (this result differs from previous reports for this system). The lower pressure step corresponds to roughly 1/3 to 1/4 the coverage interval corresponding to a complete monolayer. We determined the isosteric heat of adsorption as a function of coverage for this system. We will compare our results to previous reports, and to values for CF<sub>4</sub> on graphite. We have explored the coverage dependence of the time required for our system to reach equilibrium after gas is dosed into the cell. The equilibration times vary strongly with coverage, going from intervals greater than 60,000 seconds at low coverages, down to 600 seconds near monolayer completion. Different scenarios for interpreting our results will be presented.